

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: GUERIN-MARCHAND, Claudine
DRUILHE, Pierre
- (ii) TITLE OF INVENTION: PEPTIDE SEQUENCES SPECIFIC FOR THE
HEPATIC STAGES OF P. FALCIPARUM BEARING EPITOPES CAPABLE
OF STIMULATING THE T LYMPHOCYTES
- (iii) NUMBER OF SEQUENCES: 46
- (iv) CORRESPONDENCE ADDRESS:
(A) ADDRESSEE: Burns, Doane, Swecker & Mathis
(B) STREET: P.O. Box 1404
(C) CITY: Alexandria
(D) STATE: Virginia
(E) COUNTRY: United States
(F) ZIP: 22313-1404
- (v) COMPUTER READABLE FORM:
(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30
- (vi) CURRENT APPLICATION DATA:
(A) APPLICATION NUMBER: US 08/462,625
(B) FILING DATE: 05-JUN-1995
(C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: US 08/098,327
(B) FILING DATE: 24-NOV-1993
- (viii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: FR 91 01286
(B) FILING DATE: 05-FEB-1991
- (ix) ATTORNEY/AGENT INFORMATION:
(A) NAME: McGowan, Malcolm K.
(B) REGISTRATION NUMBER: 39,300
(C) REFERENCE/DOCKET NUMBER: 010830-078
- (x) TELECOMMUNICATION INFORMATION:
(A) TELEPHONE: (703) 836-6620
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(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Peptide

(B) LOCATION: 8

(D) OTHER INFORMATION: /note= "Amino Acid 8 wherein Xaa is Glu or Gly."

(x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884

(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Leu Ala Lys Glu Lys Leu Gln Xaa Gln Gln Ser Asp Leu Glu Gln Glu
1 5 10 15

Arg

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 amino acids

(B) TYPE: amino acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Peptide

(B) LOCATION: 1

(D) OTHER INFORMATION: /note= "Amino Acid 1 wherein Xaa is Ser or Arg."

(ix) FEATURE:

(A) NAME/KEY: Peptide

(B) LOCATION: 6

(D) OTHER INFORMATION: /note= "Amino Acid 6 wherein Xaa is Glu or Asp."

(ix) FEATURE:

(A) NAME/KEY: Peptide

(B) LOCATION: 8

(D) OTHER INFORMATION: /note= "Amino Acid 8 wherein Xaa is Arg or Leu."

(ix) FEATURE:

(A) NAME/KEY: Peptide

(B) LOCATION: 15

(D) OTHER INFORMATION: /note= "Amino Acid 15 wherein Xaa is Glu or Gly."

(x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884
 (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln
 1 5 10 15
 Gln

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Peptide
- (B) LOCATION: 2
- (D) OTHER INFORMATION: /note= "Amino Acid 2 wherein Xaa is Ser or Arg."

(ix) FEATURE:

- (A) NAME/KEY: Peptide
- (B) LOCATION: 7
- (D) OTHER INFORMATION: /note= "Amino Acid 7 wherein Xaa is Glu or Asp."

(ix) FEATURE:

- (A) NAME/KEY: Peptide
- (B) LOCATION: 9
- (D) OTHER INFORMATION: /note= "Amino Acid 9 wherein Xaa is Arg or Leu."

(ix) FEATURE:

- (A) NAME/KEY: Peptide
- (B) LOCATION: 16
- (D) OTHER INFORMATION: /note= "Amino Acid 16 wherein Xaa is Glu or Gly."

(x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884
 (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa
 1 5 10 15
 Gln

(2) INFORMATION FOR SEQ ID NO:4:

00337344 "041901

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 17 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

- (ix) FEATURE:
 (A) NAME/KEY: Peptide
 (B) LOCATION: 3
 (D) OTHER INFORMATION: /note= "Amino Acid 3 wherein Xaa is Ser or Arg."

- (ix) FEATURE:
 (A) NAME/KEY: Peptide
 (B) LOCATION: 8
 (D) OTHER INFORMATION: /note= "Amino Acid 8 wherein Xaa is Glu or Asp."

- (ix) FEATURE:
 (A) NAME/KEY: Peptide
 (B) LOCATION: 10
 (D) OTHER INFORMATION: /note= "Amino Acid 10 wherein Xaa is Arg or Leu."

- (ix) FEATURE:
 (A) NAME/KEY: Peptide
 (B) LOCATION: 17
 (D) OTHER INFORMATION: /note= "Amino Acid 17 wherein Xaa is Glu or Gly."

- (x) PUBLICATION INFORMATION:
 (H) DOCUMENT NUMBER: WO 92/13884
 (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln
 1 5 10 15

Xaa

(2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 17 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

- (ix) FEATURE:
 (A) NAME/KEY: Peptide
 (B) LOCATION: 1

00037344-041907

(ix) **FEATURE:**

- (ix) **FEATURE:**

- (ix) **FEATURE:**

- (x) PUBLICATION INFORMATION:

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

- (ii) MOLECULE TYPE: peptide

(ix) **FEATURE:**

- (A) NAME/KEY: Peptide
(B) LOCATION: 2
(D) OTHER INFORMATION: /note= "Amino Acid 2 wherein Xaa is
Glu or Gly."

(ix) **FEATURE:**

- ```
(A) NAME/KEY: Peptide
(B) LOCATION: 5
```

- (D) OTHER INFORMATION: /note= "Amino Acid 5 wherein Xaa is Ser or Arg."

(ix) FEATURE:

(ix) **FEATURE:**

(x) PUBLICATION INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Leu

(2) INFORMATION FOR SEQ ID NO:7:

**(i) SEQUENCE CHARACTERISTICS:**

(A) LENGTH: 17 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) **FEATURE:**

(A) NAME/KEY: Peptide  
(B) LOCATION: 3  
(D) OTHER INFORMATION: /note= "Amino Acid 3 wherein Xaa is  
Glu or Gly."

(ix) **FEATURE:**

(A) NAME/KEY: Peptide  
(B) LOCATION: 6  
(D) OTHER INFORMATION: /note= "Amino Acid 6 wherein Xaa is Ser or Arg."

(ix) **FEATURE:**

(A) NAME/KEY: Peptide  
(B) LOCATION: 11  
(D) OTHER INFORMATION: /note= "Amino Acid 11 wherein Xaa  
is Glu or Asp."

(ix) FEATURE:

(A) NAME/KEY: Peptide  
(B) LOCATION: 13  
(D) OTHER INFORMATION: /note= "Amino Acid 13 wherein Xaa  
is Arg or Leu."

- (H) DOCUMENT NUMBER: WO 92/13884  
(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu  
1 5 10 15

**Lys**

(2) INFORMATION FOR SEO ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

(ix) **FEATURE:**

- (A) NAME/KEY: Peptide  
(B) LOCATION: 4  
(D) OTHER INFORMATION: /note= "Amino Acid 4 wherein Xaa is  
Glu or Gly."

(ix) **FEATURE:**

- (A) NAME/KEY: Peptide  
(B) LOCATION: 7  
(D) OTHER INFORMATION: /note= "Amino Acid 7 wherein Xaa is Ser or Arg."

(ix) **FEATURE:**

- (A) NAME/KEY: Peptide  
(B) LOCATION: 12  
(D) OTHER INFORMATION: /note= "Amino Acid 12 wherein Xaa  
is Glu or Asp."

(ix) **FEATURE:**

- (A) NAME/KEY: Peptide  
(B) LOCATION: 14  
(D) OTHER INFORMATION: /note= "Amino Acid 14 wherein Xaa  
is Arg or Leu."

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884  
(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala Lys  
1 5 10 15

**Glu**

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 17 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ix) FEATURE:

- (A) NAME/KEY: Peptide  
(B) LOCATION: 5  
(D) OTHER INFORMATION: /note= "Amino Acid 5 wherein Xaa is  
Glu or Gly."

(A) NAME/KEY: Peptide  
(B) LOCATION: 8  
(D) OTHER INFORMATION: /note= "Amino Acid 8 wherein Xaa is Ser or Arg."

(A) NAME/KEY: Peptide  
(B) LOCATION: 13  
(D) OTHER INFORMATION: /note= "Amino Acid 13 wherein Xaa  
is Glu or Asp."

(A) NAME/KEY: Peptide  
(B) LOCATION: 15  
(D) OTHER INFORMATION: /note= "Amino Acid 15 wherein Xaa  
is Arg or Leu."

(H) DOCUMENT NUMBER: WO 92/13884.  
(J) PUBLICATION DATE: 20-AUG-1992

Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg Xaa Ala  
1 5 10 15

(2) INFORMATION FOR SEQ ID NO:10:

(A) LENGTH: 17 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ix) **FEATURE:**



- (ix) **FEATURE:**

- (ix) **FEATURE:**

- (ix) **FEATURE:**

- (x) PUBLICATION INFORMATION:

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

**Ala**

(2) INFORMATION FOR SEQ ID NO:11:

- (i) SEQUENCE CHARACTERISTICS:

- (ii) MOLECULE TYPE: peptide

- (ix) **FEATURE:**

- (ix) FEATURE:

- (A) NAME/KEY: Peptide  
(B) LOCATION: 10  
(D) OTHER INFORMATION: /note= "Amino Acid 10 wherein Xaa  
is Ser or Arg."

(D) OTHER INFORMATION: /note= "Amino Acid 15 wherein Xaa  
is Glu or Asp."

(D) OTHER INFORMATION: /note= "Amino Acid 17 wherein Xaa  
is Arg or Leu."

(J) PUBLICATION DATE: 20-AUG-1992

Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu Gln Xaa Arg  
1 5 10 15

## Xaa

(D) TOPOLOGY: linear

(D) OTHER INFORMATION: /note= "Amino Acid 1 wherein Xaa is Arg or Leu."

(D) OTHER INFORMATION: /note= "Amino Acid 8 wherein Xaa is Glu or Gly."

(D) OTHER INFORMATION: /note= "Amino Acid 11 wherein Xaa  
is Ser or Arg."

(D) OTHER INFORMATION: /note= "Amino Acid 16 wherein Xaa  
is Glu or Asp."



## (2) INFORMATION FOR SEQ ID NO:14:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Peptide
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "Amino Acid 1 wherein Xaa is Glu or Asp."

## (ix) FEATURE:

- (A) NAME/KEY: Peptide
- (B) LOCATION: 3
- (D) OTHER INFORMATION: /note= "Amino Acid 3 wherein Xaa is Arg or Leu."

## (ix) FEATURE:

- (A) NAME/KEY: Peptide
- (B) LOCATION: 10
- (D) OTHER INFORMATION: /note= "Amino Acid 10 wherein Xaa is Glu or Gly."

## (ix) FEATURE:

- (A) NAME/KEY: Peptide
- (B) LOCATION: 13
- (D) OTHER INFORMATION: /note= "Amino Acid 13 wherein Xaa is Ser or Arg."

## (x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu Glu  
 1                      5                      10                      15

Gln

## (2) INFORMATION FOR SEQ ID NO:15:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

09837344-041901

Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp Leu  
1 5 10 15  
Glu

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 17 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

- ```
(ix) FEATURE:
      (A) NAME/KEY: Peptide
      (B) LOCATION: 3
      (D) OTHER INFORMATION: /note= "Amino Acid 3 wherein Xaa is
          Glu or Asp."
```

- ```
(ix) FEATURE:
 (A) NAME/KEY: Peptide
 (B) LOCATION: 5
 (D) OTHER INFORMATION: /note= "Amino Acid 5 wherein Xaa is
 Arg or Leu."
```

(D) OTHER INFORMATION: /note= "Amino Acid 12 wherein Xaa  
is Glu or Gly."

(D) OTHER INFORMATION: /note= "Amino Acid 15 wherein Xaa  
is Ser or Arg."

(J) PUBLICATION DATE: 20-AUG-1992

Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa Asp  
1 5 10 15

Leu

(D) TOPOLOGY: linear

(D) OTHER INFORMATION: /note= "Amino Acid 4 wherein Xaa is Glu or Asp."

(D) OTHER INFORMATION: /note= "Amino Acid 6 wherein Xaa is Arg or Leu."

(D) OTHER INFORMATION: /note= "Amino Acid 13 wherein Xaa  
is Glu or Gly."

(D) OTHER INFORMATION: /note= "Amino Acid 16 wherein Xaa  
is Ser or Arg."

(H) DOCUMENT NUMBER: WO 92/13884  
(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln Xaa  
1 5 10 15

**Asp**

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

(ix) **FEATURE:**

- (A) NAME/KEY: Peptide  
(B) LOCATION: 5  
(D) OTHER INFORMATION: /note= "Amino Acid 5 wherein Xaa is  
Glu or Asp."

(ix) **FEATURE:**

- (A) NAME/KEY: Peptide  
(B) LOCATION: 7  
(D) OTHER INFORMATION: /note= "Amino Acid 7 wherein Xaa is  
Arg or Leu."

(ix) **FEATURE:**

- (A) NAME/KEY: Peptide  
(B) LOCATION: 14  
(D) OTHER INFORMATION: /note= "Amino Acid 14 wherein Xaa  
is Glu or Gly."

(ix) **FEATURE:**

- (A) NAME/KEY: Peptide  
(B) LOCATION: 17  
(D) OTHER INFORMATION: /note= "Amino Acid 17 wherein Xaa  
is Ser or Arg."

(x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884  
(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEO ID NO:18:

Asp Leu Glu Gln Xaa Arg Xaa Ala Lys Glu Lys Leu Gln Xaa Gln Gln  
1 5 10 15

## Xaa

## (2) INFORMATION FOR SEQ ID NO:19:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 107 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Arg Lys Ala Asp Thr Lys Lys Asn Leu Glu Arg Lys Lys Glu His Gly  
 1 5 10 15  
 Asp Ile Leu Ala Glu Asp Leu Tyr Gly Arg Leu Glu Ile Pro Ala Ile  
 20 25 30  
 Glu Leu Pro Ser Glu Asn Glu Arg Gly Tyr Tyr Ile Pro His Gln Ser  
 35 40 45  
 Ser Leu Pro Gln Asp Asn Arg Gly Asn Ser Arg Asp Ser Lys Glu Ile  
 50 55 60  
 Ser Ile Ile Glu Lys Thr Asn Arg Glu Ser Ile Thr Thr Asn Val Glu  
 65 70 75 80  
 Gly Arg Arg Asp Ile His Lys Gly His Leu Glu Glu Lys Lys Asp Gly  
 85 90 95  
 Ser Ile Lys Pro Glu Gln Lys Glu Asp Lys Ser  
 100 105

## (2) INFORMATION FOR SEQ ID NO:20:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 117 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Leu Gln Glu Gln Gln Arg Asp Leu Glu Gln Arg Lys Ala Asp Thr Lys  
 1 5 10 15



Lys Asn Leu Glu Arg Lys Lys Glu His Gly Asp Ile Leu Ala Glu Asp  
 20 25 30

Leu Tyr Gly Arg Leu Glu Ile Pro Ala Ile Glu Leu Pro Ser Glu Asn  
 35 40 45

Glu Arg Gly Tyr Tyr Ile Pro His Gln Ser Ser Leu Pro Gln Asp Asn  
 50 55 60

Arg Gly Asn Ser Arg Asp Ser Lys Glu Ile Ser Ile Ile Glu Lys Thr  
 65 70 75 80

Asn Arg Glu Ser Ile Thr Thr Asn Val Glu Gly Arg Arg Asp Ile His  
 85 90 95

Lys Gly His Leu Glu Glu Lys Lys Asp Gly Ser Ile Lys Pro Glu Gln  
 100 105 110

Lys Glu Asp Lys Ser  
 115

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Asp Thr Lys Lys Asn Leu Glu Arg Lys Lys Glu His Gly Asp Ile Leu  
 1 5 10 15

Ala Glu Asp Leu Tyr Gly Arg Leu Glu Ile Pro  
 20 25

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

0937344-041901

Gln Arg Lys Ala Asp Thr Lys Lys  
20

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(X) PUBLICATION INFORMATION:  
(H) DOCUMENT NUMBER: WO 92/13884  
(J) PUBLICATION DATE: 20-AUG-1992

Glu Ser Ile Thr Thr Asn Val Glu Gly Arg Arg Asp Ile His Lys  
20 25 30

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 151 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(X) PUBLICATION INFORMATION:  
(H) DOCUMENT NUMBER: WO 92/13884  
(J) PUBLICATION DATE: 20-AUG-1992

Phe Asn Ser Leu Val Lys Ser Val Gln Gln Glu Gln Gln His Asn Val  
35 40 45

Glu Glu Lys Val Glu Glu Ser Val Glu Glu Asn Asp Glu Glu Ser Val  
50 55 60

Glu Glu Asn Val Glu Glu Asn Val Glu Glu Asn Asp Asp Gly Ser Val  
65 70 75 80

Ala Ser Ser Val Glu Glu Ser Ile Ala Ser Ser Val Asp Glu Ser Ile  
85 90 95

Asp Ser Ser Ile Glu Glu Asn Val Ala Pro Thr Val Glu Glu Ile Val  
100 105 110

Ala Pro Thr Val Glu Glu Ile Val Ala Pro Ser Val Val Glu Lys Cys  
115 120 125

Ala Pro Ser Val Glu Glu Ser Val Ala Pro Ser Val Glu Glu Ser Val  
130 135 140

Ala Glu Met Leu Lys Glu Arg  
145 150

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 47 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Arg Asp Glu Leu Phe Asn Glu Leu Leu Asn Ser Val Asp Val Asn Gly  
1 5 10 15

Glu Val Lys Glu Asn Ile Leu Glu Glu Ser Gln Val Asn Asp Asp Ile  
20 25 30

Phe Asn Ser Leu Val Lys Ser Val Gln Gln Glu Gln Gln His Asn  
35 40 45

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

## (x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884

(J) PUBLICATION DATE: 20-AUG-1992

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Asp Glu Leu Phe Asn Glu Leu Leu Asn Ser Val Asp Val Asn Gly Glu  
 1 5 10 15  
 Val Lys Glu Asn Ile Leu Glu Glu Ser Gln  
 20 25

## (2) INFORMATION FOR SEQ ID NO:27:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 amino acids

(B) TYPE: amino acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884

(J) PUBLICATION DATE: 20-AUG-1992

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

Leu Glu Glu Ser Gln Val Asn Asp Asp Ile Phe Ser Asn Ser Leu Val  
 1 5 10 15  
 Lys Ser Val Gln Gln Glu Gln Gln His Asn Val  
 20 25

## (2) INFORMATION FOR SEQ ID NO:28:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 amino acids

(B) TYPE: amino acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884

(J) PUBLICATION DATE: 20-AUG-1992

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

Val Glu Lys Cys Ala Pro Ser Val Glu Glu Ser Val Ala Pro Ser Val  
 1 5 10 15  
 Glu Glu Ser Val Ala Glu Met Leu Lys Glu Arg  
 20 25

09837344-04100

(2) INFORMATION FOR SEQ ID NO:29:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

- (X) PUBLICATION INFORMATION:  
(H) DOCUMENT NUMBER: WO 92/13884  
(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

TTGTTCTAGA TCGCTTT

17

(2) INFORMATION FOR SEQ ID NO:30:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 15 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii). MOLECULE TYPE: DNA (genomic)

- (X) PUBLICATION INFORMATION:  
(H) DOCUMENT NUMBER: WO 92/13884  
(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

AAAG<sup>i</sup>AAGATA AATCT

15

(2) INFORMATION FOR SEQ ID NO:31: (79)

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 316 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

- (X) PUBLICATION INFORMATION:  
(H) DOCUMENT NUMBER: WO 92/13884  
(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln  
1 5 10 15

Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu Lys Leu Gln Glu  
 20 25 30  
 Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln  
 35 40 45  
 Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu  
 50 55 60  
 Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys  
 65 70 75 80  
 Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu  
 85 90 95  
 Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys  
 100 105 110  
 Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala  
 115 120 125  
 Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg  
 130 135 140  
 Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg  
 145 150 155 160  
 Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu  
 165 170 175  
 Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln  
 180 185 190  
 Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Arg Asp Leu Glu  
 195 200 205  
 Gln Arg Lys Ala Asp Thr Lys Lys Asn Leu Glu Arg Lys Lys Glu His  
 210 215 220  
 Gly Asp Ile Leu Ala Glu Asp Leu Tyr Gly Arg Leu Glu Ile Pro Ala  
 225 230 235 240  
 Ile Glu Leu Pro Ser Glu Asn Glu Arg Gly Tyr Tyr Ile Pro His Gln  
 245 250 255  
 Ser Ser Leu Pro Gln Asp Asn Arg Gly Asn Ser Arg Asp Ser Lys Glu  
 260 265 270  
 Ile Ser Ile Ile Glu Lys Thr Asn Arg Glu Ser Ile Thr Thr Asn Val  
 275 280 285  
 Glu Gly Arg Arg Asp Ile His Lys Gly His Leu Glu Glu Lys Lys Asp  
 290 295 300  
 Gly Ser Ile Lys Pro Glu Gln Lys Glu Asp Lys Ser  
 305 310 315

0037344-041901

## (2) INFORMATION FOR SEQ ID NO:32:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 950 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA (genomic)

## (x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

|                                                                   |     |
|-------------------------------------------------------------------|-----|
| AAAGCGATCT AGAACAAGAG AGACGTGCTA AAGAAAAGTT GCAAGAACAA CAAAGCGATT | 60  |
| TAGAACAAGA TAGACTTGCT AAAGAAAAGT TACAAGAGCA GCAAAGCGAT TTAGAACAAG | 120 |
| AGAGACTTGC TAAAGAAAAG TTGCAAGAAC AACAAAGCGA TCTAGAACAA GAGAGACGTG | 180 |
| CTAAAGAAAA GTTGCAAGAA CAACAAAGCG ATTTAGAACA AGAGAGACGT GCTAAAGAAA | 240 |
| AGTTGCAAGA ACAACAAAGC GATTTAGAAC AAGATAGACT TGCTAAAGAA AAGTTACAAG | 300 |
| AGCAGCAAAG CGATTTAGAA CAAGAGAGAC GTGCTAAAGA AAAGTTGCAA GAACAACAAA | 360 |
| GCGATTTAGA ACAAGAGAGA CGTGCTAAAG AAAAGTTGCA AGAACAACAA AGCGATTTAG | 420 |
| AACAAGAGAG ACTTGCTAAA GAAAAGTTGC AAGAACAACA AAGCGATTTA GAACAAGAGA | 480 |
| GACGTGCTAA AGAAAAGTTG CAAGAACAAC AAAGCGATTT AGAACAAGAG AGACGTGCTA | 540 |
| AAGAAAAGTT GCAAGAACAA CAAAGCGATT TAGAACAAGA GAGACGTGCT AAAGAAAAGT | 600 |
| TGCAAGAGCA GCAAAGAGAT TTAGAACAAA GGAAGGCTGA TACGAAAAAA AATTTAGAAA | 660 |
| GAAAAAAGGA ACATGGAGAT ATATTAGCAG AGGATTTATA TGGTCGTTTA GAAATACCAG | 720 |
| CTATAGAACT TCCATCAGAA AATGAACGTG GATATTATAT ACCACATCAA TCTTCTTTAC | 780 |
| CTCAGGACAA CAGAGGGAAT AGTAGAGATT CCAAGGAAAT ATCTATAATA GAAAAAACAA | 840 |
| ATAGAGAATC TATTACAACA AATGTTGAAG GACGAAGGGA TATACATAAA GGACATCTTG | 900 |
| AAGAAAAGAA AGATGGTTCA ATAAACCAG AACAAAAAGA AGATAAATCT             | 950 |

## (2) INFORMATION FOR SEQ ID NO:33:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 464 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884

(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

|                                                                    |     |
|--------------------------------------------------------------------|-----|
| GAATTCCGTG ATGAACTTTT TAATGAATTA TTAAATAGTG TAGATGTAA TGGAGAAGTA   | 60  |
| AAAGAAAATA TTTTGGAGGA AAGTCAAGTT AATGACGATA TTTTAAATAG TTTAGTAAAA  | 120 |
| AGTGTTC AAC AAGAACAACA ACACAATGTT GAAGAAAAAG TTGAAGAAAG TGTAGAAGAA | 180 |
| AATGACGAAG AAAGTGTAGA AGAAAATGTA GAAGAAAATG TAGAAGAAAA TGACGACGGA  | 240 |
| AGTGTAGCCT CAAGTGTGTA AGAAAGTATA GCTTCAAGTG TTGATGAAAG TATAGATTCA  | 300 |
| AGTATTGAAG AAAATGTAGC TCCAACGTGTT GAAGAAATCG TAGCTCCAAC TGTGTAAGAA | 360 |
| ATTGTAGCTC CAAGTGTGTT AGAAAAGTGT GCTCCAAGTG TTGAAGAAAG TGTAGCTCCA  | 420 |
| AGTGTGAAG AAAGTGTAGC TGAAATGTTG AAGGAAAGGA ATTC                    | 464 |

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 988 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884

(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

|                                                                   |     |
|-------------------------------------------------------------------|-----|
| AAAGTATACA TCTTCCTTCT TTAATTCTTA AAATGAAACA TATTTTGTAC ATATCATTTT | 60  |
| ACTTTATCCT TGTAAATTTA TTGATATTTT ATATAAATGG AAAGATAATA AAGAATTCTG | 120 |
| AAAAAGATGA AATCATAAAA TCTAACTTGA GAAGTGGTTC TTCAAATTCT AGGAATCGAA | 180 |
| TAAATGAGGA AAATCACGAG AAGAAACACG TTTTATCTCA TAATTCATAT GAGAAAACTA | 240 |
| AAAATAATGA AAATAATAAA TTTTTCGATA AGGATAAAGA GTTAACGATG TCTAATGTAA | 300 |
| AAAATGTGTC ACAACAAAT TTCAAAAGTC TTTTAAGAAA TCTTGGTGTG TCAGAGAATA  | 360 |
| TATTCCTTAA AGAAAATAAA TTAAATAAGG AAGGGAAATT AATTGAACAC ATAATAAATG | 420 |
| ATGATGACGA TAAAAAATAA TATATTAAAG GGCAAGACGA AAACAGACAA GAAGATCTTG | 480 |



AAGAAAAAGC AGCTAAAGAA AAGTTACAGG GGCAACAAAG CGATTTCAGAA CAAGAGAGAC 540  
 GTGCTAAAGA AAAGTTGCAA GAACAACAAA GCGATTTAGA ACAAGAGAGA CTTGCTAAAG 600  
 AAAAGTTGCA AGAACAACAA AGCGATTTAG AACAAGAGAG ACGTGCTAAA GAAAAGTTGC 660  
 AAGAACAACA AAGCGATTTA GAACAAGAGA GACTTGCTAA AGAAAAGTTG CAAGAACAAC 720  
 AAAGCGATTT AGAACAAGAG AGACGTGCTA AAGAAAAGTT GCAAGAACAA CAAAGCGATT 780  
 TAGAACAAGA GAGACGTGCT AAAGAAAAGT TGCAAGAACA ACAAAGCGAT TTAGAACAAG 840  
 AGAGACTTGC TAAAGAAAAG TTACAAGAGC AGCAAAGCGA TTTAGAACAA GATAGACTTG 900  
 CTAAAGAAAA GTTGCAAGAA CAACAAAGCG ATTTAGAACA AGAGAGACGT GCTAAAGAAA 960  
 GGTTCGAAGA ACAACAAAGC GATTTAGA 988

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

ATGAAACATA TT

12

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

AAGCGATTTA GA

12

(2) INFORMATION FOR SEQ ID NO:37:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 954 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA (genomic)

## (ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..954

## (x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

|                                                                 |     |
|-----------------------------------------------------------------|-----|
| ATG AAA CAT ATT TTG TAC ATA TCA TTT TAC TTT ATC CTT GTT AAT TTA | 48  |
| Met Lys His Ile Leu Tyr Ile Ser Phe Tyr Phe Ile Leu Val Asn Leu |     |
| 5 10 15                                                         |     |
| TTG ATA TTT CAT ATA AAT GGA AAG ATA ATA AAG AAT TCT GAA AAA GAT | 96  |
| Leu Ile Phe His Ile Asn Gly Lys Ile Ile Lys Asn Ser Glu Lys Asp |     |
| 20 25 30                                                        |     |
| GAA ATC ATA AAA TCT AAC TTG AGA AGT GGT TCT TCA AAT TCT AGG AAT | 144 |
| Glu Ile Ile Lys Ser Asn Leu Arg Ser Gly Ser Ser Asn Ser Arg Asn |     |
| 35 40 45                                                        |     |
| CGA ATA AAT GAG GAA AAT CAC GAG AAG AAA CAC GTT TTA TCT CAT AAT | 192 |
| Arg Ile Asn Glu Glu Asn His Glu Lys Lys His Val Leu Ser His Asn |     |
| 50 55 60                                                        |     |
| TCA TAT GAG AAA ACT AAA AAT AAT GAA AAT AAT AAA TTT TTC GAT AAG | 240 |
| Ser Tyr Glu Lys Thr Lys Asn Asn Glu Asn Asn Lys Phe Phe Asp Lys |     |
| 65 70 75 80                                                     |     |
| GAT AAA GAG TTA ACG ATG TCT AAT GTA AAA AAT GTG TCA CAA ACA AAT | 288 |
| Asp Lys Glu Leu Thr Met Ser Asn Val Lys Asn Val Ser Gln Thr Asn |     |
| 85 90 95                                                        |     |
| TTC AAA AGT CTT TTA AGA AAT CTT GGT GTT TCA GAG AAT ATA TTC CTT | 336 |
| Phe Lys Ser Leu Leu Arg Asn Leu Gly Val Ser Glu Asn Ile Phe Leu |     |
| 100 105 110                                                     |     |
| AAA GAA AAT AAA TTA AAT AAG GAA GGG AAA TTA ATT GAA CAC ATA ATA | 384 |
| Lys Glu Asn Lys Leu Asn Lys Glu Gly Lys Leu Ile Glu His Ile Ile |     |
| 115 120 125                                                     |     |
| AAT GAT GAT GAC GAT AAA AAA AAA TAT ATT AAA GGG CAA GAC GAA AAC | 432 |
| Asn Asp Asp Asp Asp Lys Lys Lys Tyr Ile Lys Gly Gln Asp Glu Asn |     |
| 130 135 140                                                     |     |
| AGA CAA GAA GAT CTT GAA GAA AAA GCA GCT AAA GAA AAG TTA CAG GGG | 480 |
| Arg Gln Glu Asp Leu Glu Glu Lys Ala Ala Lys Glu Lys Leu Gln Gly |     |

| 145                                                             | 150 | 155 | 160 |     |
|-----------------------------------------------------------------|-----|-----|-----|-----|
| CAA CAA AGC GAT TCA GAA CAA GAG AGA CGT GCT AAA GAA AAG TTG CAA |     |     |     | 528 |
| Gln Gln Ser Asp Ser Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln | 165 | 170 | 175 |     |
| GAA CAA CAA AGC GAT TTA GAA CAA GAG AGA CTT GCT AAA GAA AAG TTG |     |     |     | 576 |
| Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys Glu Lys Leu | 180 | 185 | 190 |     |
| CAA GAA CAA CAA AGC GAT TTA GAA CAA GAG AGA CGT GCT AAA GAA AAG |     |     |     | 624 |
| Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys | 195 | 200 | 205 |     |
| TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAG AGA CTT GCT AAA GAA |     |     |     | 672 |
| Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys Glu | 210 | 215 | 220 |     |
| AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAG AGA CGT GCT AAA |     |     |     | 720 |
| Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys | 225 | 230 | 235 | 240 |
| GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAG AGA CGT GCT |     |     |     | 768 |
| Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala | 245 | 250 | 255 |     |
| AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAG AGA CTT |     |     |     | 816 |
| Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu | 260 | 265 | 270 |     |
| GCT AAA GAA AAG TTG CAA GAG CAG CAA AGC GAT TTA GAA CAA GAT AGA |     |     |     | 864 |
| Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg | 275 | 280 | 285 |     |
| CTT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAG |     |     |     | 912 |
| Leu Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu | 290 | 295 | 300 |     |
| AGA CGT GCT AAA GAA AGG TTG CAA GAA CAA CAA AGC GAT TTA         |     |     |     | 954 |
| Arg Arg Ala Lys Glu Arg Leu Gln Glu Gln Gln Ser Asp Leu         | 305 | 310 | 315 |     |

## (2) INFORMATION FOR SEQ ID NO:38:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1493 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA (genomic)

## (x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

|                                                                   |      |
|-------------------------------------------------------------------|------|
| CAAGAACAAC AAAGCGATCT AGAACAAGAG AGACGTGCTA AAGAAAAGTT GCAAGAACAA | 60   |
| CAAAGCGATT TAGAACAAGA TAGACTTGCT AAAGAAAAGT TACAAGAGCA GCAAAGCGAT | 120  |
| TTAGAACAAG AGAGACTTGC TAAGAAAAGT TGCAAGAACA ACAAAGCGAT CTAGAACAAG | 180  |
| AGAGACGTGC TAAAGAAAAG TTGCAAGAAC AACAAAGCGA TTTAGAACAA GAGAGACGTG | 240  |
| CTAAAGAAAA GTTGCAAGAA CAACAAAGCG ATTTAGAACA AGATAGACTT GCTAAAGAAA | 300  |
| AGTTACAAGA GCAGCAAAGC GATTTAGAAC AAGAGAGACG TGCTAAAGAA AAGTTGCAAG | 360  |
| AACAACAAAG CGATTTAGAA CAAGAGAGAC GTGCTAAGAA AAGTTGCAAG AACAACAAAG | 420  |
| CGATTTAGAA CAAGAGAGAC TTGCTAAAGA AAAGTTGCAA GAACAACAAA GCGATTTAGA | 480  |
| ACAAGAGAGA CGTGCTAAAG AAAAGTTGCA AGAACAACAA AGCGATTTAG AACAAGAGAG | 540  |
| ACGTGCTAAG AAAAGTTGCA AGAACAACAA AGCGATTTAG AACAAGAGAG ACGTGCTAAA | 600  |
| GAAAAGTTGC AAGAGCAGCA AAGAGATTTA GAACAAAGGA AGGCTGATAC GAAAAAAAAT | 660  |
| TTAGAAAGAA AAAAGGAACA TGGAGATATA TTAGCAGAGG ATTTATATGG TCGTTTAGAA | 720  |
| ATACAGCTA TAGAACTTCC ATCAGAAAAT GAACGTGGAT ATTATATACC ACATCAATCT  | 780  |
| TCTTTACCTC AGGACAACAG AGGGAATAGT AGAGATTCCA AGGAAATATC TATAATAGAA | 840  |
| AAAACAAATA GAGAATCTAT TACAACAAAT GTTGAAGGAC GAAGGGATAT ACATAAAGGA | 900  |
| CATCTTGAAG AAAAGAAAGA TGGTTCAATA AAACCAGAAC AAAAAGAAGA TAAATCTGCT | 960  |
| GACATACAAA ATCATACTT AGAGACAGTA AATATTTCTG ATGTTAATGA TTTTCAAATA  | 1020 |
| AGTAAGTATG AGGATGAAAT AAGTGCTGAA TATGACGATT CATTAATAGA TGAAGAAGAA | 1080 |
| GATGATGAAG ACTTAGACGA ATTTAAGCCT ATTGTGCAAT ATGACAATTT CCAAGATGAA | 1140 |
| GAAAACATAG GAATTTATAA AGAACTAGAA GATTTGATAG AGAAAAATGA AAATTTAGAT | 1200 |
| GATTTAGATG AAGGAATAGA AAAATCATCA GAAGAATTAT CTGAAGAAAA AATAAAAAAA | 1260 |
| GGAAAGAAAT ATGAAAAAAC AAAGGATAAT AATTTTAAAC CAAATGATAA AAGTTTGTAT | 1320 |
| GATGAGCATA TTAATAAATA TAAAAATGAT AAGCAGGTTA ATAAGGAAAA GGAAAAATTC | 1380 |
| ATAAATCAT TGTTCATAT ATTTGACGGA GACAATGAAA TTTTACAGAT CGTGGATGAG   | 1440 |
| TTATCTGAAG ATATAACTAA ATATTTTATG AAACATAAAA AGGTTATATA TTT        | 1493 |

## (2) INFORMATION FOR SEQ ID NO:39:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 12 base pairs

- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

CAAGAACAAC AA

12

(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

GGTATATAT TT

12

(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1482 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..1482

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

CAA GAA CAA CAA AGC GAT CTA GAA CAA GAG AGA CGT GCT AAA GAA AAG  
Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys  
1 5 10 15

48

|                                                                                                                                                       |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAT AGA CTT GCT AAA GAA<br>Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu<br>20 25 30        | 96  |
| AAG TTA CAA GAG CAG CAA AGC GAT TTA GAA CAA GAG AGA CTT GCT AAA<br>Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys<br>35 40 45        | 144 |
| GAA AAG TTG CAA GAA CAA CAA AGC GAT CTA GAA CAA GAG AGA CGT GCT<br>Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala<br>50 55 60        | 192 |
| AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAG AGA CGT<br>Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg<br>65 70 75 80     | 240 |
| GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAT AGA<br>Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg<br>85 90 95        | 288 |
| CTT GCT AAA GAA AAG TTG CAA GAG CAG CAA AGC GAT TTA GAA CAA GAG<br>Leu Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Glu<br>100 105 110     | 336 |
| AGA CGT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA<br>Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln<br>115 120 125     | 384 |
| GAG AGA CGT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA<br>Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu<br>130 135 140     | 432 |
| CAA GAG AGA CTT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA<br>Gln Glu Arg Leu Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu<br>145 150 155 160 | 480 |
| GAA CAA GAG AGA CGT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT<br>Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp<br>165 170 175     | 528 |
| TTA GAA CAA GAG AGA CGT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC<br>Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser<br>180 185 190     | 576 |
| GAT TTA GAA CAA GAG AGA CGT GCT AAA GAA AAG TTG CAA GAG CAG CAA<br>Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln<br>195 200 205     | 624 |
| AGA GAT TTA GAA CAA AGG AAG GCT GAT ACG AAA AAA AAT TTA GAA AGA<br>Arg Asp Leu Glu Gln Arg Lys Ala Asp Thr Lys Lys Asn Leu Glu Arg<br>210 215 220     | 672 |
| AAA AAG GAA CAT GGA GAT ATA TTA GCA GAG GAT TTA TAT GGT CGT TTA<br>Lys Lys Glu His Gly Asp Ile Leu Ala Glu Asp Leu Tyr Gly Arg Leu<br>225 230 235 240 | 720 |

|                                                                                                                                                    |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------|
| GAA ATA CCA GCT ATA GAA CTT CCA TCA GAA AAT GAA CGT GGA TAT TAT<br>Glu Ile Pro Ala 245 Glu Leu Pro Ser Glu Asn Glu Arg Gly Tyr Tyr 255             | 768  |
| ATA CCA CAT CAA TCT TCT TTA CCT CAG GAC AAC AGA GGG AAT AGT AGA<br>Ile Pro His 260 Gln Ser Ser Leu Pro Gln Asp Asn Arg Gly Asn Ser Arg 270         | 816  |
| GAT TCC AAG GAA ATA TCT ATA ATA GAA AAA ACA AAT AGA GAA TCT ATT<br>Asp Ser 275 Glu Ile Ser Ile 280 Glu Lys Thr Asn Arg Glu Ser Ile 285             | 864  |
| ACA ACA AAT GTT GAA GGA CGA AGG GAT ATA CAT AAA GGA CAT CTT GAA<br>Thr 290 Asn Val Glu Gly Arg Asp Ile His Lys Gly His Leu Glu 300                 | 912  |
| GAA AAG AAA GAT GGT TCA ATA AAA CCA GAA CAA AAA GAA GAT AAA TCT<br>Glu Lys Lys Asp Gly Ser Ile Lys Pro Glu 310 Gln Lys Glu Asp Lys Ser 320         | 960  |
| GCT GAC ATA CAA AAT CAT ACA TTA GAG ACA GTA AAT ATT TCT GAT GTT<br>Ala Asp Ile Gln Asn 325 His Thr Leu Glu Thr Val Asn Ile Ser Asp Val 335         | 1008 |
| AAT GAT TTT CAA ATA AGT AAG TAT GAG GAT GAA ATA AGT GCT GAA TAT<br>Asn Asp Phe 340 Gln Ile Ser Lys Tyr 345 Glu Asp Glu Ile Ser 350 Ala Glu Tyr 350 | 1056 |
| GAC GAT TCA TTA ATA GAT GAA GAA GAA GAT GAT GAA GAC TTA GAC GAA<br>Asp Asp Ser Leu Ile Asp Glu 355 Glu Glu Asp Asp Glu 365 Leu Asp Glu 365         | 1104 |
| TTT AAG CCT ATT GTG CAA TAT GAC AAT TTC CAA GAT GAA GAA AAC ATA<br>Phe Lys 370 Pro Ile Val Gln Tyr 375 Asp Asn Phe Gln Asp Glu Glu Asn Ile 380     | 1152 |
| GGA ATT TAT AAA GAA CTA GAA GAT TTG ATA GAG AAA AAT GAA AAT TTA<br>Gly Ile Tyr Lys Glu 385 Leu Glu Asp Leu Ile Glu Lys Asn Glu Asn Leu 400         | 1200 |
| GAT GAT TTA GAT GAA GGA ATA GAA AAA TCA TCA GAA GAA TTA TCT GAA<br>Asp Asp Leu Asp 405 Glu Gly Ile Glu Lys 410 Ser Ser Glu Glu Leu Ser Glu 415     | 1248 |
| GAA AAA ATA AAA AAA GGA AAG AAA TAT GAA AAA ACA AAG GAT AAT AAT<br>Glu Lys Ile Lys Lys Gly Lys Lys Tyr 420 Glu Lys Thr Lys Asp Asn Asn 430         | 1296 |
| TTT AAA CCA AAT GAT AAA AGT TTG TAT GAT GAG CAT ATT AAA AAA TAT<br>Phe Lys 435 Pro Asn Asp Lys Ser 440 Leu Tyr Asp Glu His 445 Ile Lys Lys Tyr 445 | 1344 |
| AAA AAT GAT AAG CAG GTT AAT AAG GAA AAG GAA AAA TTC ATA AAA TCA<br>Lys Asn Asp Lys Gln Val 450 Asn Lys Glu Lys Glu Lys Phe Ile Lys Ser 460         | 1392 |

TTG TTT CAT ATA TTT GAC GGA GAC AAT GAA ATT TTA CAG ATC GTG GAT 1440  
 Leu Phe His Ile Phe Asp Gly Asp Asn Glu Ile Leu Gln Ile Val Asp  
 465 470 475 480

GAG TTA TCT GAA GAT ATA ACT AAA TAT TTT ATG AAA CTA TAA 1482  
 Glu Leu Ser Glu Asp Ile Thr Lys Tyr Phe Met Lys Leu  
 485 490

(2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..12

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

AAG GTT ATA TAT  
 Lys Val Ile Tyr

12

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(x) PUBLICATION INFORMATION:

- (H) DOCUMENT NUMBER: WO 92/13884
- (J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

CAAGAACAAC AA

12

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single



(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884

(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

ATGAAACTAT AA

12

(2) INFORMATION FOR SEQ ID NO:45:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1482 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

(A) NAME/KEY: CDS

(B) LOCATION: 1..1482

(x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884

(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

|                                                                 |     |
|-----------------------------------------------------------------|-----|
| CAA GAA CAA CAA AGC GAT CTA GAA CAA GAG AGA CGT GCT AAA GAA AAG | 48  |
| Gln Gln Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys     |     |
| 5 10 15                                                         |     |
| TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAT AGA CTT GCT AAA GAA | 96  |
| Leu Gln Glu Gln Ser Asp Leu Glu Gln Asp Arg Leu Ala Lys Glu     |     |
| 20 25 30                                                        |     |
| AAG TTA CAA GAG CAG CAA AGC GAT TTA GAA CAA GAG AGA CTT GCT AAA | 144 |
| Lys Leu Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg Leu Ala Lys     |     |
| 35 40 45                                                        |     |
| GAA AAG TTG CAA GAA CAA CAA AGC GAT CTA GAA CAA GAG AGA CGT GCT | 192 |
| Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln Glu Arg Arg Ala     |     |
| 50 55 60                                                        |     |
| AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAG AGA CGT | 240 |
| Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln Glu Arg Arg     |     |
| 65 70 75 80                                                     |     |
| GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA GAT AGA | 288 |
| Ala Lys Glu Lys Leu Gln Glu Gln Gln Ser Asp Leu Glu Gln Asp Arg |     |
| 85 90 95                                                        |     |

|                                                                                                                                    |     |
|------------------------------------------------------------------------------------------------------------------------------------|-----|
| CTT GCT AAA GAA AAG TTA CAA GAG CAG CAA AGC GAT TTA GAA CAA GAG<br>Leu Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln Glu     | 336 |
| 100 105 110                                                                                                                        |     |
| AGA CGT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA CAA<br>Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu Gln     | 384 |
| 115 120 125                                                                                                                        |     |
| GAG AGA CGT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA GAA<br>Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu Glu     | 432 |
| 130 135 140                                                                                                                        |     |
| CAA GAG AGA CTT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT TTA<br>Gln Glu Arg Leu Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp Leu     | 480 |
| 145 150 155 160                                                                                                                    |     |
| GAA CAA GAG AGA CGT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC GAT<br>Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Ser Asp     | 528 |
| 165 170 175                                                                                                                        |     |
| TTA GAA CAA GAG AGA CGT GCT AAA GAA AAG TTG CAA GAA CAA CAA AGC<br>Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Ser     | 576 |
| 180 185 190                                                                                                                        |     |
| GAT TTA GAA CAA GAG AGA CGT GCT AAA GAA AAG TTG CAA GAG CAG CAA<br>Asp Leu Glu Gln Glu Arg Arg Ala Lys Glu Lys Leu Gln Glu Gln Gln | 624 |
| 195 200 205                                                                                                                        |     |
| AGA GAT TTA GAA CAA AGG AAG GCT GAT ACG AAA AAA AAT TTA GAA AGA<br>Arg Asp Leu Glu Gln Arg Lys Ala Asp Thr Lys Lys Asn Leu Glu Arg | 672 |
| 210 215 220                                                                                                                        |     |
| AAA AAG GAA CAT GGA GAT ATA TTA GCA GAG GAT TTA TAT GGT CGT TTA<br>Lys Lys Glu His Gly Asp Ile Leu Ala Glu Asp Leu Tyr Gly Arg Leu | 720 |
| 225 230 235 240                                                                                                                    |     |
| GAA ATA CCA GCT ATA GAA CTT CCA TCA GAA AAT GAA CGT GGA TAT TAT<br>Glu Ile Pro Ala Ile Glu Leu Pro Ser Glu Asn Glu Arg Gly Tyr Tyr | 768 |
| 245 250 255                                                                                                                        |     |
| ATA CCA CAT CAA TCT TCT TTA CCT CAG GAC AAC AGA GGG AAT AGT AGA<br>Ile Pro His Gln Ser Ser Leu Pro Gln Asp Asn Arg Gly Asn Ser Arg | 816 |
| 260 265 270                                                                                                                        |     |
| GAT TCC AAG GAA ATG TCT ATA ATA GAA AAA ACA AAT AGA GAA TCT ATT<br>Asp Ser Lys Glu Met Ser Ile Ile Glu Lys Thr Asn Arg Glu Ser Ile | 864 |
| 275 280 285                                                                                                                        |     |
| ACA ACA AAT GTT GAA GGA CGA AGG GAT ATA CAT AAA GGA CAT CTT GAA<br>Thr Thr Asn Val Glu Gly Arg Arg Asp Ile His Lys Gly His Leu Glu | 912 |
| 290 295 300                                                                                                                        |     |
| GAA AAG AAA GAT GGT TCA ATA AAA CCA GAA CAA AAA GAA GAT AAA TCT<br>Glu Lys Lys Asp Gly Ser Ile Lys Pro Glu Gln Lys Glu Asp Lys Ser | 960 |
| 305 310 315 320                                                                                                                    |     |

|                                                                                                                                                       |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| GCT GAC ATA CAA AAT CAT ACA TTA GAG ACA GTA AAT ATT TCT GAT GTT<br>Ala Asp Ile Gln Asn His Thr Leu Glu Thr Val Asn Ile Ser Asp Val<br>325 330 335     | 1008 |
| AAT GAT TTT CAA ATA AGT AAG TAT GAG GAT GAA ATA AGT GCT GAA TAT<br>Asn Asp Phe Gln Ile Ser Lys Tyr Glu Asp Glu Ile Ser Ala Glu Tyr<br>340 345 350     | 1056 |
| GAC GAT TCA TTA ATA GAT GAA GAA GAA GAT GAT GAA GAC TTA GAC GAA<br>Asp Asp Ser Leu Ile Asp Glu Glu Glu Asp Asp Glu Asp Leu Asp Glu<br>355 360 365     | 1104 |
| TTT AAG CCT ATT GTG CAA TAT GAC AAT TTC CAA GAT GAA GAA AAC ATA<br>Phe Lys Pro Ile Val Gln Tyr Asp Asn Phe Gln Asp Glu Glu Asn Ile<br>370 375 380     | 1152 |
| GGA ATT TAT AAA GAA CTA GAA GAT TTG ATA GAG AAA AAT GAA AAT TTA<br>Gly Ile Tyr Lys Glu Leu Glu Asp Leu Ile Glu Lys Asn Glu Asn Leu<br>385 390 395 400 | 1200 |
| GAT GAT TTA GAT GAA GGA ATA GAA AAA TCA TCA GAA GAA TTA TCT GAA<br>Asp Asp Leu Asp Glu Gly Ile Glu Lys Ser Ser Glu Glu Leu Ser Glu<br>405 410 415     | 1248 |
| GAA AAA ATA AAA AAA GGA AAG AAA TAT GAA AAA ACA AAG GAT AAT AAT<br>Glu Lys Ile Lys Lys Gly Lys Lys Tyr Glu Lys Thr Lys Asp Asn Asn<br>420 425 430     | 1296 |
| TTT AAA CCA AAT GAT AAA AGT TTG TAT GAT GAG CAT ATT AAA AAA TAT<br>Phe Lys Pro Asn Asp Lys Ser Leu Tyr Asp Glu His Ile Lys Lys Tyr<br>435 440 445     | 1344 |
| AAA AAT GAT AAG CAG GTT AAT AAG GAA AAG GAA AAA TTC ATA AAA TCA<br>Lys Asn Asp Lys Gln Val Asn Lys Glu Lys Glu Lys Phe Ile Lys Ser<br>450 455 460     | 1392 |
| TTG TTT CAT ATA TTT GAC GGA GAC AAT GAA ATT TTA CAG ATC GTG GAT<br>Leu Phe His Ile Phe Asp Gly Asp Asn Glu Ile Leu Gln Ile Val Asp<br>465 470 475 480 | 1440 |
| GAG TTA TCT GAA GAT ATA ACT AAA TAT TTT ATG AAA CTA TAA<br>Glu Leu Ser Glu Asp Ile Thr Lys Tyr Phe Met Lys Leu<br>485 490                             | 1482 |

## (2) INFORMATION FOR SEQ ID NO:46:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: DNA (genomic)

## (ix) FEATURE:

- (A) NAME/KEY: CDS

(B) LOCATION: 1..12

(x) PUBLICATION INFORMATION:

(H) DOCUMENT NUMBER: WO 92/13884

(J) PUBLICATION DATE: 20-AUG-1992

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

AAG GTT ATA TAT  
Lys-Val Ile Tyr

1

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